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Short communication

Detection of antibodies to *Neospora caninum* in two species of wild canids, *Lycalopex gymnocercus* and *Cerdocyon thous* from Brazil

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Abstract

Domestic dog (*Canis domesticus*) and the coyote (*Canis latrans*) are the only known definitive hosts for the protozoan *Neospora caninum* that causes abortion in dairy cattle. In the present study, antibodies to *N. caninum* were sought in three species of wild canids, *Cerdocyon thous*, *Lycalopex gymnocercus* and *Dusicyon vetulus* from Brazil. Antibodies to *N. caninum* were assayed by the indirect fluorescent antibody test (IFAT) and the *Neospora* agglutination test (NAT). *N. caninum* antibodies were found in five of 12 *L. gymnocercus* with IFAT titers of 1:50 in three, 1:100 in one, and 1:1600 in one, and NAT titers of 1:40, 1:80, 1:160, 1:320, and 1:640 in five animals. Antibodies to *N. caninum* were found in four of 15 *C. thous* with IFAT titers of 1:50 in one, and

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1:100 in three, and NAT titer of 1:40 in one animal. All 30 *D. ventulus* were seronegative by IFAT and NAT.

Keywords: *Neospora caninum*; Wild canids; *Cerdocyon thous*; *Lycalopex gymnocercus*; *Dusicyon vetulus*; Antibodies; Brazil

1. Introduction

The coccidium *Neospora caninum* is an important cause of abortion in cattle worldwide (Dubey and Lindsay, 1996; Dubey, 2003a). It also causes mortality in sheep, goats, horses, rhinoceros, and deer. Domestic dog (*Canis domesticus*) and the coyote (*Canis latrans*) are the two known definitive hosts for *N. caninum* that excrete the environmentally resistant oocysts (McAllister et al., 1998; Basso et al., 2001; Gondim et al., 2004). Because both dogs and coyotes excrete only a few *N. caninum* oocysts compared with other coccidians, other wild carnivores have not been ruled out as its definitive hosts. Antibodies to *N. caninum* have been reported in several species of domestic and wild animals (Dubey, 2003b). We report antibodies to *N. caninum* for the first time in two species of wild canids from Brazil.

2. Materials and methods

Sera were collected from three species of wild canids (*Lycalopex gymnocercus*, *Dusicyon vetulus*, and *Cerdocyon thous*) captured in traps and were part of larger project on the epidemiology and control of infections diseases in wild animals in Brazil. The *L. gymnocercus* ($n = 12$) were from the state of Rio Grande do Sul, *D. vetulus* ($n = 30$) were from the state of Paraíba, and *C. thous* ($n = 15$) from the state of São Paulo and Paraná.

Blood samples were collected from a jugular or brachial vein, the sera were separated, and stored at $-20\,^{\circ}$C until being tested for anti-*N. caninum* antibodies. The indirect immunofluorescent antibody test (IFAT) with a cut-off value of 1:50 and *Neospora* agglutination test (NAT) with cut-off value of 1:40 were used to screen for *N. caninum* antibodies. The seropositive samples were tested further in two-fold serial dilutions.

For IFAT, tachyzoites of the *N. caninum* NC-1 strain were used as antigen (Dubey et al., 1988). Anti-dog IgG–FITC conjugate from rabbit (Sigma, F7884, St. Louis, Missouri) was used as the fluorescent label, and a positive and a negative domestic dog sera were used in each slide as controls. The NAT was performed using mouse-derived *N. caninum* tachyzoites as described by Romand et al. (1998).

3. Results and discussion

N. caninum antibodies were found in five of 12 *L. gymnocercus* with IFAT titers of 1:50 in three, 1:100 in one, and 1:1600 in one, and NAT titers of 1:40, 1:80, 1:160, 1:320, and 1:640 in five animals. Antibodies to *N. caninum* were found in four of 15 *C. thous* with

IFAT titers of 1:50 in one, and 1:100 in three, and NAT titer of 1:40 in one animal. All 30 *D. vetulus* were seronegative by IFAT and NAT. Results of the present study indicate that additional species of carnivores have been exposed to *N. caninum*. It remains to be determined if these animals can shed *N. caninum* oocysts.

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